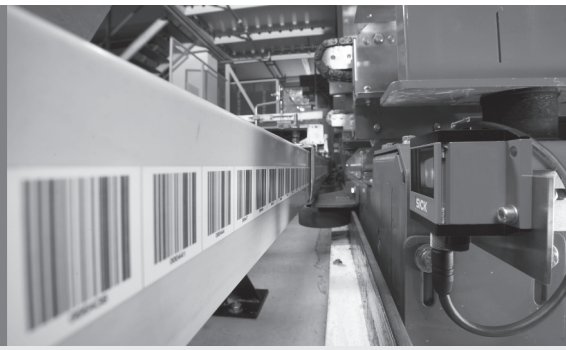
OPERATING INSTRUCTIONS



OLM200 – PROFINET IO

Linear measurement sensor

EN

Applicable to firmware ≥ V2.1

SICK
Sensor Intelligence.

This document is protected by the law of copyright, whereby all rights established therein remain with the company SICK AG. Reproduction of this document or parts of this document is only permissible within the limits of the legal determination of Copyright Law. Alteration or abridgement of the document is not permitted without the explicit written approval of the company SICK AG.

Note SICK uses standard IP technology in its products, such as I/O link and industrial PCs. The emphasis is placed on availability of products and services. SICK always assumes that the integrity and the confidentiality of the data and rights which are affected by the use of the aforementioned products are ensured by the customer. In any case, appropriate security measures, such as network separation, fire walls, virus protection or patch management, are always to be taken by the customer, depending on the situation.

Contents

1 About this document 5
1.1 Function of this document 5
1.2 Information depth 5
1.3 Scope 5
1.4 Symbols used 6

2 Product description 7
2.1 Safety notes 7
2.1.1 Safety standard 7
2.1.2 Correct use 7
2.1.3 Areas of application 7
2.2 Device designation and corresponding bar code tapes 7
2.2.1 Type plate 8
2.3 Principle of operation 8
2.4 Control marks 9
2.4.1 Control marks for operation 9

3 Mounting 10
3.1 Bar code tape mounting 10
3.1.1 General data for the bar code tape 10
3.1.2 Mounting of the bar code tape at horizontal curves 12
3.1.3 Mounting of the bar code tape on vertical curves 13
3.2 Sensor mounting 14

4 Electrical installation 16
4.1 Position of the electrical plug connections 16
4.1.1 Ethernet interface 16
4.1.2 Supply voltage connection 17
4.2 General notes for electrical installation 17
4.3 Wiring notes 17

5 Commissioning 19
5.1 Device configuration 19
5.1.1 Import device description file (GSD) 19
5.1.2 Configuring the participants 19
5.1.3 Parameterization 20
5.1.4 Factory setting 20
5.2 Ethernet parameter list and factory settings 20
5.3 PROFIBUS IO interface 22
5.3.1 Nomenclature 22
5.3.2 Description of PROFNETI modules for configuration and I/O data 22
5.3.3 Module 1: “Position/i2w” 26
5.3.4 Module 2: “Position/i1w” 27
5.3.5 Module 3: “Speed/i2w” 27
5.3.6 Module 4: “Position/i2w, Speed/i2w” 28
5.3.7 Module 5: “Position/i2w, Preset dyn/o2w” 29
5.3.8 Module 10: “Status/i1b” 30
5.3.9 Module 12: “Label/i3b”, “res/1b” 31
5.3.10 Module 13: “Temp/i1b, Level/i2b, res/i2b” 31
5.3.11 Module 20: “MF1 Output Q” 32
5.3.12 Module 21: “MF2 Input” 33
5.3.13 Module 22: “Preset stat and Offset” 34

5.3.14 Module 30: “Serial no/i8b” 34
5.3.15 Module 31: “Product code/i14b” 34
5.3.16 Module 32: “Version HW/i8b” 35
5.3.17 Module 33: “Version FPGA/i10w” 35
5.3.18 Module 34: “Version µC/i10w” 35
5.3.19 Module 35: “Version µC2/i10w” 36

6 Maintenance 37

7 Technical data 38
7.1 Data sheet OLM200 – PROFINET IO 38
7.2 Data sheet bar code tape 40
7.3 Dimensional drawing 41
7.4 Accessories 42
7.4.1 Plug connectors and cables 42
7.4.2 Bar code tape 44
7.4.3 Bar code tape printing 45
7.4.4 Order notes and variants of the bar code tape 45
7.4.5 Bar code tape repair kit 49
7.4.6 Blank labels for repair codes or control marks 49
7.4.7 Sliding nuts 49

8 Error tables and countermeasures 50
8.1 Device errors and warnings 50
8.2 Communication error 51
8.2.1 Ethernet errors 51
8.2.2 PROFINET IO errors 51

9 Repair 52
9.1 Repair barcode tape 52

10 Appendix 53
10.1 List of figures 53
10.2 List of tables 54

1 About this document

Please read through this chapter carefully before you use the documentation and work with the linear measurement sensor OLM200.

1.1 Function of this document

This operating instruction instructs the technical personnel of the machine manufacturer or machine owner in safe mounting, configuration, electrical installation, commissioning as well as operation and maintenance of the linear measurement sensor OLM200, and also the associated bar code tape.

This operating instruction does not provide information about operation of the machine in which the linear measurement sensor OLM200 is or will be integrated. For information about this, refer to the operating instruction of the machine.

1.2 Information depth

This operating instruction contains information about the linear measurement sensor OLM200 on the following topics:

- Device designation
- Mounting
- Electrical installation
- Commissioning and configuration
- Fault tables and counter measures
- Technical data
- Accessories

All official and statutory regulations governing operation of the linear measurement sensor OLM200 must be complied with.

Note Please also refer to the website at: www.mysick.com/en/OLM200

There, one can find:

- available control codes and position codes for download as a PDF file,
- sample applications,
- a list of FAQs for the linear measurement sensor OLM200,
- SOPAS Engineering Tool for configuration,
- information about software updates,
- Device description file GSD.

1.3 Scope

Note This operating instruction applies to the linear measurement sensor OLM200.

1.4 Symbols used

Note Notes inform you about special aspects of the device.

WARNING

Warning!

A warning refers to specific or potential dangers. This is intended to protect you against accidents.

Read the warnings carefully and comply with them!

2 Product description

This chapter contains information about the special properties of the linear measurement sensor OLM200. It describes the construction and operating principle of the device, especially the various operating modes.

Always read this chapter before mounting, installing or operating the device.

2.1 Safety notes

2.1.1 Safety standard

The linear measurement sensor OLM200 has been developed, produced and tested in accordance with the applicable safety standards. It is in accordance with the state of the art.

The radiation safety has been evaluated based on the DIN EN 62471 standard, “Photobiological safety of lamps and lamp systems”. It is allocated to the “free group”, i.e. safety of the eyes and the skin against radiation is guaranteed at all times assuming the device is used correctly (in particular, this implies not opening the device).

2.1.2 Correct use

The linear measurement sensor OLM200 is an opto-electronic sensor and is used for positioning of a movement unit by means of a bar code tape.

WARNING

Protection of the operating personnel and of the device is not guaranteed if the device is not used in accordance with its correct use.

2.1.3 Areas of application

The linear measurement sensor OLM200 is suitable for the following areas of application:

- automated high-bay warehouse,
- positioning of overhead conveyors, curve-going stackers, turning rings/tables, shuttles,
- applications in which movable devices need to be positioned relative to a reference.

2.2 Device designation and corresponding bar code tapes

Tab. 1: Device designation

Data interface	Device designation	Part no.	Bar code width	Reading distance
PROFINET IO	OLM200-1009	1058126	30 mm	100 mm ± 20 mm

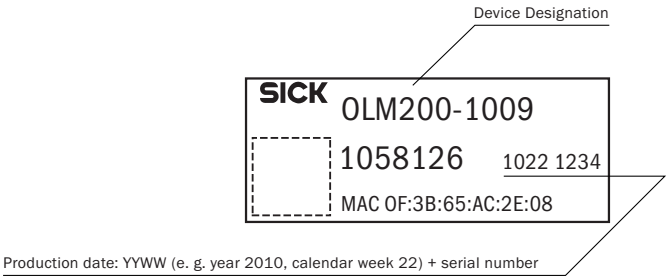
Note Accessories available for the OLM200-xx0x variants are the appropriate bar code tapes with a bar code width of 30 mm and a tape height of 30 mm or 40 mm.

Note A bar code tape with a height of 30 mm is sufficient in applications in which the linear measurement sensor OLM200 does not exceed a tolerance of ± 3.5 mm perpendicular to the transport direction.

The bar code tape with a height of 40 mm permits a tolerance of up to ± 8.5 mm.

2.2.1 Type plate

Fig. 1:
Type plate



2.3 Principle of operation

The linear measurement sensor OLM200 is a sensor that can measure traverse paths up to 10 km without moving parts. The sensor determines its position via a bar code tape attached along the traverse path and uses a visible, red LED beam to do this. By reading the bar codes that are printed on the bar code tape at intervals of 3 cm (OLM200–xx0x), the linear measurement sensor OLM200 determines the absolute position and outputs this via an interface. Traverse speeds of up to 10 m/s are possible with a repeatability of 0.15 mm.

On startup, the linear measurement sensor OLM200 initially detects its alignment in relation to the bar code tape (0° or 180°). The sensor automatically adapts itself to the alignment that is detected, and starts outputting position values.

If there are no bar codes in the field of view when the sensor is started up, the sensor selects the last known orientation of the bar code tape. The sensor starts position values output as soon as bar codes with the expected orientation are located in the field of view. Error F4 and the measured value “0” are output if an unexpected alignment is detected, and this also applies if the alignment is changed along the traverse path. In such a case, position values are not output until after the supply voltage has been interrupted and the new alignment has been detected successfully.

Note The tape orientation is assumed to be 0° in the delivery state.

Note If the bar code tape is mounted in the entire system with an alignment of 180° in relation to the sensor, it is necessary to ensure that the bar code tape is located in the field of view when the sensor is started up for the first time.

If the linear measurement sensor OLM200 detects an error condition while in motion (e.g. no bar code tape or bar code tape defective), this is initially suppressed and extrapolated measured values are output. The extrapolation time depends on the measured value history and is max. 160 ms. The extrapolation time can be set by control marks or via SOPAS ET (see page 21, parameter "Extrapolation time"). The measured value “0” is output if the error status is present or longer or exists right from switching on. Individual faulty bar codes do not have any effect on the measured value.

Error statuses can be interrogated via the data interface. Alternatively, the SOPAS ET software is available for this via the Ethernet configuration interface.

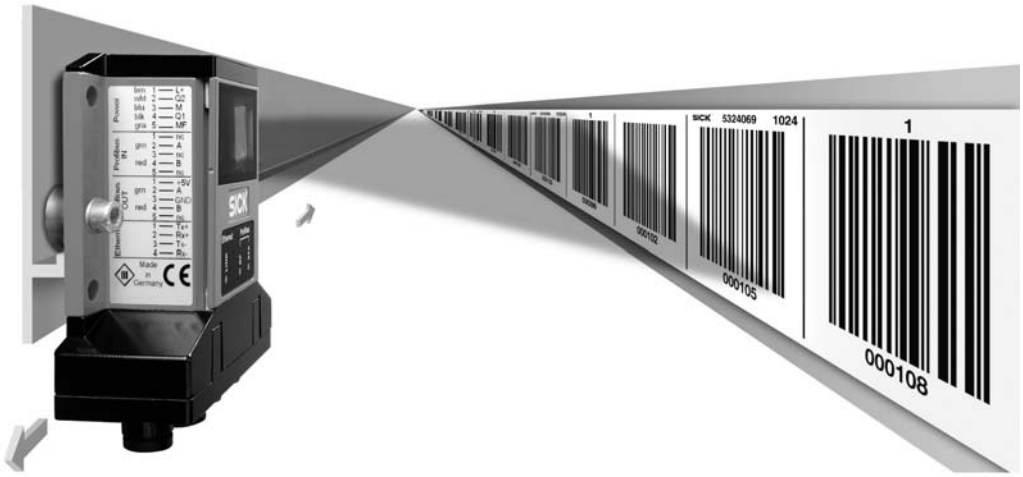


Fig. 2:
Schematic representation of the mode of function OLM200

2.4 Control marks

Note The control marks are available for download and subsequent print at www.mysick.com/en/OLM200.

2.4.1 Control marks for operation

If required, control marks can be stuck onto the bar code tape at selected points (e.g. switches). When doing this, make sure that the cut markings of the control mark are congruent with the cut markings of the position bar code that has been stuck over. Control marks transmit specific information to the linear measurement sensor OLM200.

The information on a control mark consists of a letter (A, B, C, D or Z) followed by two digits (0 ... 9).

The control marks are available for download from www.mysick.com/en/OLM200, and can then be printed out.

The control marks Q00 and Q01 control the switching output of the device. In this case, Q01 sets the switching output to active. Q00 sets the switching output to inactive.

All other control marks are output via the PROFINET IO as ASCII hex values. The control mark must be interpreted byte-by-byte as ASCII characters. In this case, the most recently read control mark is always output every cycle.

Example: Control mark A98 corresponds to 0x41, 0x39, 0x38

Note In order to obtain a continuous distance value, it is necessary to ensure that there is a position code directly before or directly after the control mark.

Note Only one control mark may be within the field of view at any given time. Therefore, a minimum of two bar codes must be placed between successive control marks.

3 Mounting

This chapter describes how to prepare and perform the mounting of the bar code tape and the linear measurement sensor OLM200.

Note Illustrations and dimension values not in brackets apply to the 30 mm bar code width.

3.1 Bar code tape mounting

3.1.1 General data for the bar code tape

Bar code tapes have a nominal length of 20 m; they are supplied rolled-up with the smallest number on the outside. The particular measuring ranges are selected so that successive bar code tapes can be placed against one another without gaps.

The roll sequence number is located on the bar code tapes to make it easier to maintain the correct sequence.

Bar code tapes with customer specific range start with the roll sequence number “1”, independent of the desired starting code.

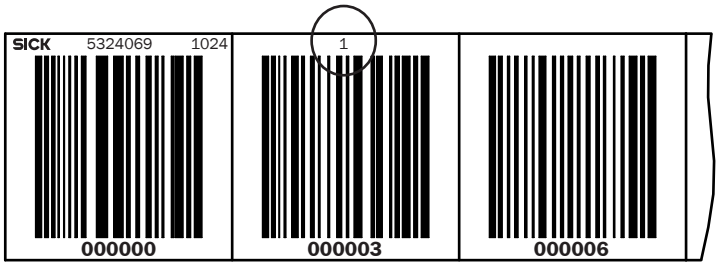


Fig. 3: Example for roll 1, measuring range 0 to 20 m

Measuring range [m] from	to	Roll sequence number	Code Start	Code End
0	20	**1** (see Fig. 3)	000000	002001
20	40	2	002004	004002
40	60	3	004005	006000
60	80	4	006003	008001
80	100	5	008004	010002
100	120	6	010005	012000
120	140	7	012003	014001
140	160	8	014004	016002
160	180	9	016005	018000
180	200	10	018003	020001
200	220	11	020004	022002
220	240	12	022005	024000
240	260	13	024003	026001
260	280	14	026004	028002
280	300	15	028005	030000
300	320	16	030003	032001
320	340	17	032004	034002
340	360	18	034005	036000
360	380	19	036003	038001
380	400	20	038004	040002
400	420	21	040005	042000
420	440	22	042003	044001
440	460	23	044004	046002

Measuring range [m] from	to	Roll sequence number	Code Start	Code End
460	480	24	046005	048000
480	500	25	048003	050001

The orientation of the bar code tape in relation to the sensor must remain the same throughout the entire traverse path (alignment always 0° or always 180° in relation to the sensor).

Align the bar code tape with a reference edge (e.g. rail) of the traverse path and stick this onto the smooth, dry surface that is free from grease and dust, without any tension, folds or creases.

It is possible to stick the tape over small expansion joints and minor points of unevenness. In the case of unevenness or gaps which would cause the bar code tape to be significantly distorted were they to be stuck over, it is possible to cut out an individual bar code at the corresponding cut marks.

To ensure optimum linearity, the distance between the two cut marks at the resulting gap must be 30 mm. At least two successive bar codes must follow after a gap.

It is recommended that self-adhesive, cut-to-length blank labels should be stuck over the gap in order to allow it to be traversed without problems (see section 7.4 “Accessories”).

Fig. 4:
Cut mark of the bar code tape

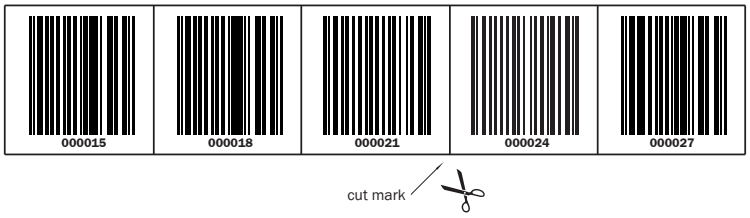
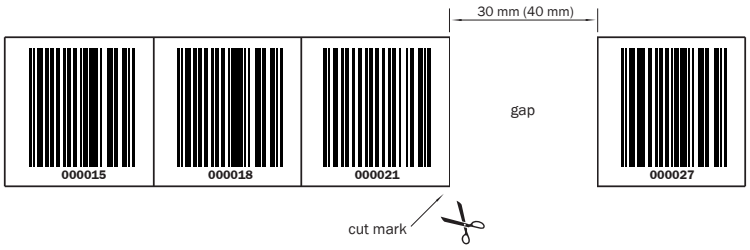


Fig. 5:
Gap in the cut-open bar code tape

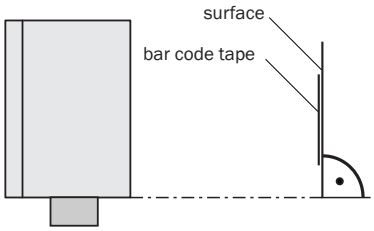


A sequence of bar code tapes without successive measuring ranges is not allowed, otherwise a continuous position cannot be indicated. In case of discontinuation (e.g. at track changes), the linear measurement sensor OLM200 outputs a corresponding jump in the position value as soon as at least two successive bar codes have been detected in the new measuring range.

The linear measurement sensor OLM200 cannot output any negative position values. Therefore, in applications in which it is necessary to go below the “0 cm” position (e.g. turntables, track changes), it is recommended not to use the measuring range 0 to 20 m, or else to remove the first two bar codes “0 cm” and “3 cm”.

Note Affix the bar code tape as near as possible to the vertical in order to avoid dust buildups.

Fig. 6:
Vertical bar code tape mounting

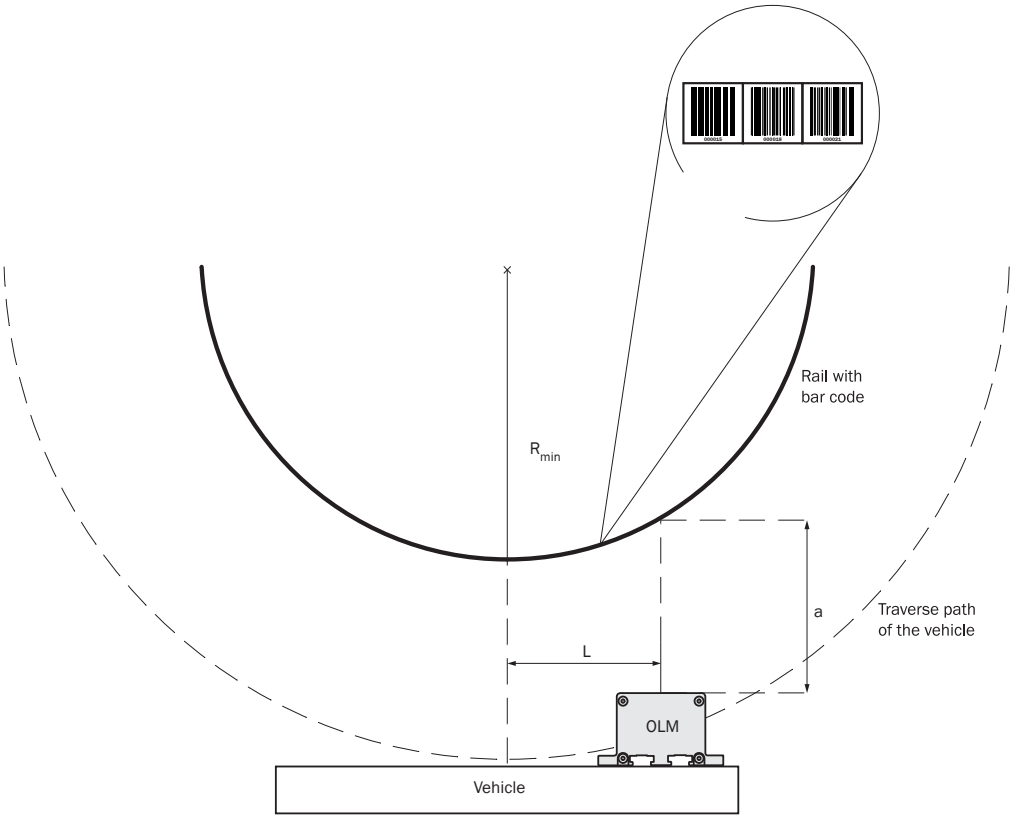


Note Avoid strong external light reflections striking the bar code tape.

3.1.2 Mounting of the bar code tape at horizontal curves

A minimum radius must be complied with for horizontal curves. This depends on the mounting position of the sensor. Generally the linear measurement sensor OLM200 should be mounted preferably in the axis of rotation. Tangential distances, referred to below as L, leading to the sensor swiveling in or out during the course of a curve mean that larger curve radii are required. This applies both to outer and inner radii.

Fig. 7:
Tangential distance L when cornering



Legend:
R_{min} = Minimum radius
L = Tangential distance when cornering
a = Reading distance

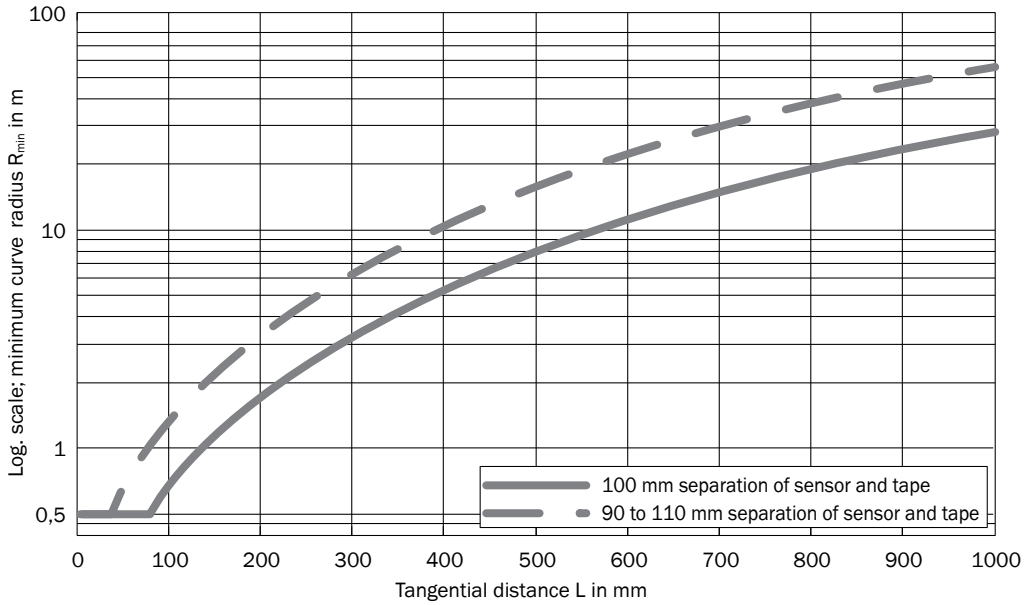


Fig. 8:
Minimum curve radius R_{min} depending on the tangential distance L

3.1.3 Mounting of the bar code tape on vertical curves

In order to attach the bar code tape along a vertical curve, cut into the bar code tape at the cut marks and fan it out. The maximum angle is not allowed to exceed 3°. This corresponds to a gap d of 1.5 mm or 2 mm (with 30 mm or 40 mm high bar code tape, respectively). This produces a minimum radius of 500 mm. The voids created by fanning open should not have a shiny surface, in order to ensure an optimum functional reserve.

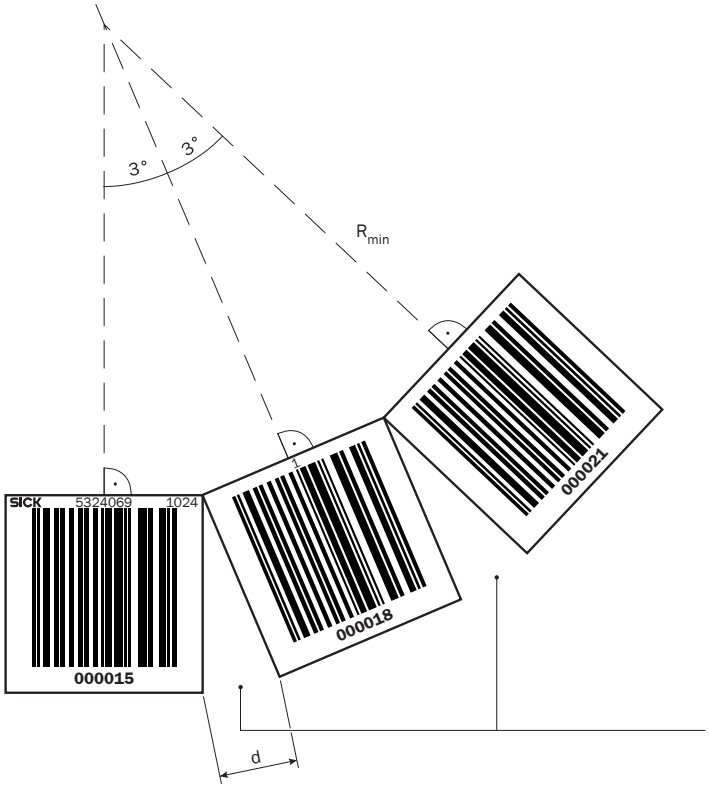


Fig. 9:
Vertical curves

Open items must be taped off with blank labels (see section 7.4 “Accessories”).

Note Make sure that the bar code tape is always in the field of view of the linear measurement sensor OLM200 along a vertical curve. The mounting location of the OLM200 should therefore be selected so that its traverse path runs parallel to the linear axis of the bar code tape. If, as a deviation from this, the OLM200 is mounted with a tangential distance from the axis of rotation, this will result in swiveling of the sensor and the bar code tape will move out of the field of view.

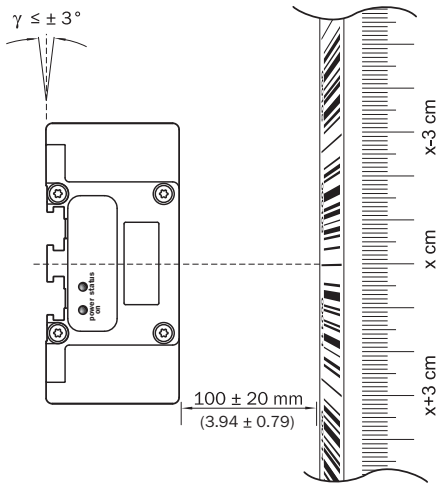
Note Only restricted accuracy and reproducibility are possible with a vertical curve.

3.2 Sensor mounting

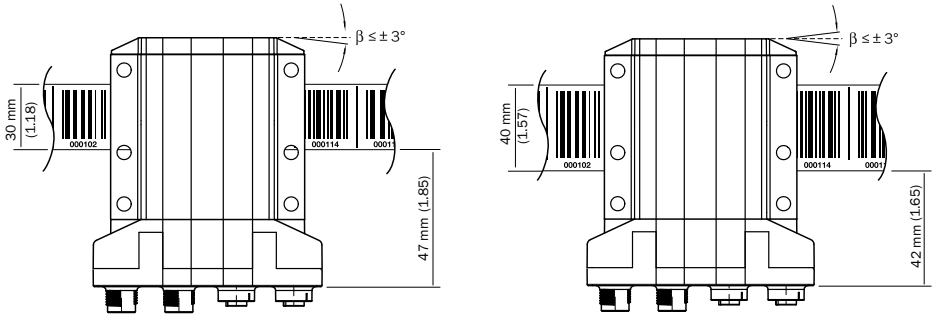
The linear measurement sensor OLM200 can be mounted either using the six holes in the housing or the T-slots on the back, using sliding nuts (see section 7.4 “Accessories”).

To ensure optimum reading results and the greatest possible functional reserve, mount the linear measurement sensor OLM200 at a distance of 100 mm from the bar code tape and align it at right angles to the bar code tape. The sensor's depth of field is ± 20 mm.

Fig. 10:
Mounting distances OLM200



A distance of 47 mm or 42 mm must be maintained between the bottom edge of the housing and the bottom edge of the SICK bar code tape.

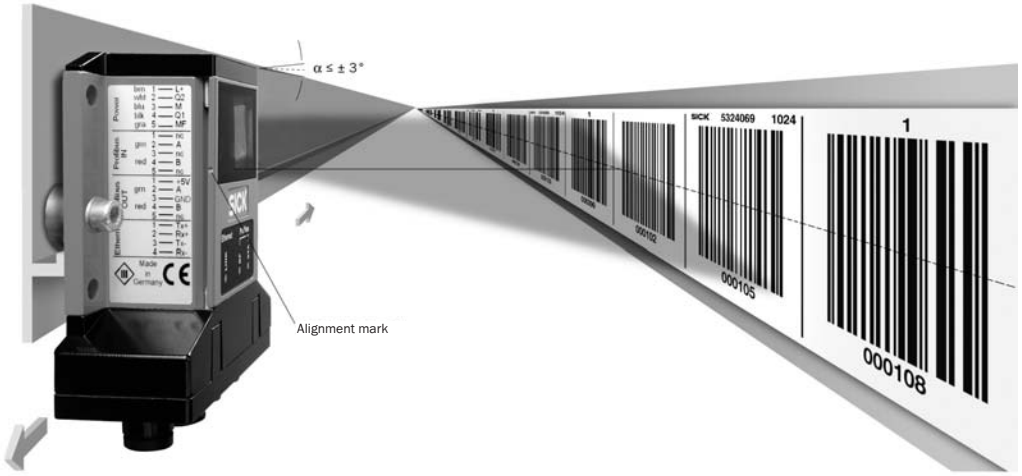


Note In particular in curves, take care to maintain a distance of 100 mm ± 20 mm from the bar code tape.

If optimally aligned, the two alignment marks on the front of the OLM200 are located in the vertical middle of the bar code tape, so that the red luminous row running from the top left to the bottom right is vertically centered on the bar code bar (see Fig. 11).

This centering must be within a tolerance of ± 3.5 mm or ± 8.5 mm respectively for the 30 mm or 40 mm height SICK bar code tape.

Fig. 11:
Vertical alignment 0LM200

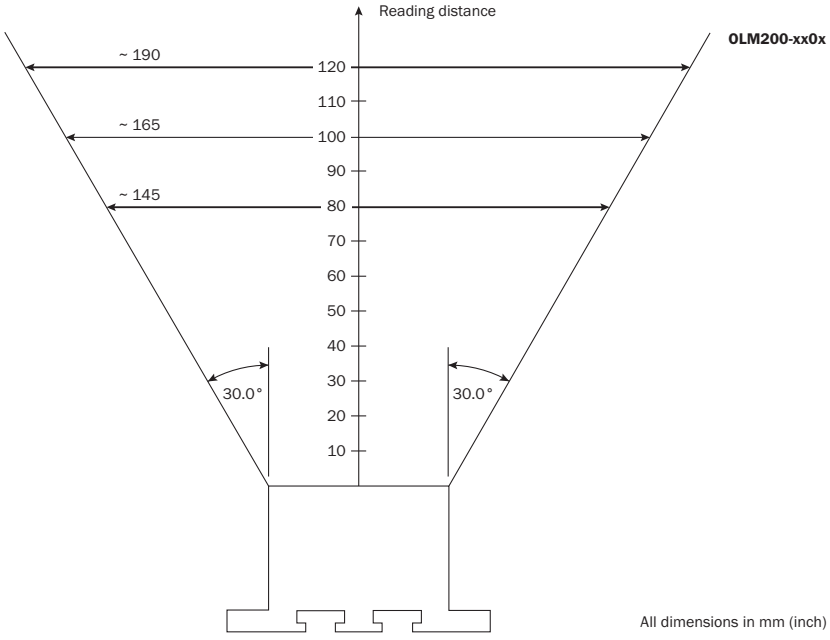


When two sensors are operated next to one another, it is necessary to maintain a minimum gap between the two sensors of 120 mm.

At curves, make sure that the sensor is mounted as close as possible to the axis of rotation. For information about the minimum radii at curves, refer to section 3.1.2 “Mounting of the bar code tape at horizontal curves” on page 12.

Note The sensor must be mounted in a way that no objects are within the field of view, obstructing a clear view of the bar code tape.

Fig. 12:
Field of view of the 0LM200



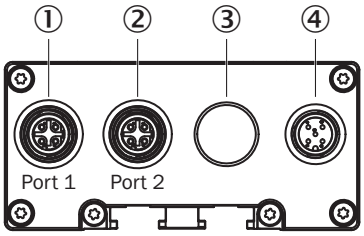
4 Electrical installation

Secure data transmission is possible when using shielded cables with twisted-pair wires. A correct and complete shield concept is required for trouble-free function. Specifically, it is necessary to ensure that the cable shield contacts the control cabinet and the linear measurement sensor OLM200 at both ends. The cable shield of the cables with terminals (see section 7.4 “Accessories” on page 42) is connected to the knurled nut and the functional earth connection pin, and therefore to the sensor housing. Equipotential bonding currents must be prevented from flowing along the cable shield by taking suitable measures.

4.1 Position of the electrical plug connections

The position of the electrical connections can be seen in the following illustration.

Fig. 13: Connections of the OLM200 PROFINET IO



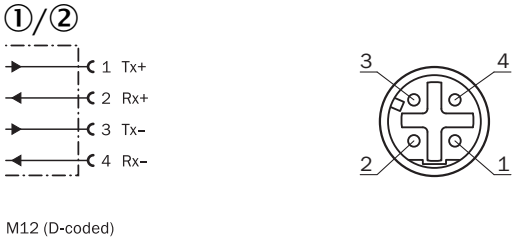
① Ethernet, socket M12, 4-pin
② Ethernet, socket M12, 4-pin
③ not connected
④ Device connection (supply voltage), plug M12, 5-pin

4.1.1 Ethernet interface

The OLM200-xxx9 is equipped with two Ethernet interfaces. They serve communication via PROFINET IO and diagnosis and parameterization via SOPAS ET. The two interfaces have equal priorities and are internally connected to one switch.

Fig. 14: *Connection diagram Ethernet*

①/② Ethernet interface



Connect the OLM200 to the network via Ethernet connection lines.

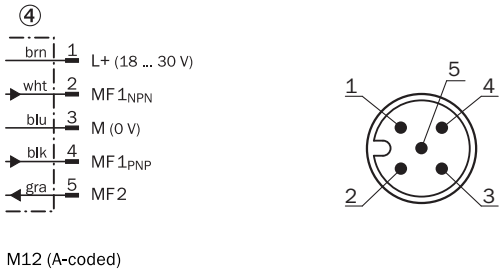
If the network is not forwarded to another network participant, connection to one of the Ethernet female connectors is sufficient. Close the female connectors not in use with a cover or a blind plug.

4.1.2 Supply voltage connection

The OLM200 is configured with electrical protection class III. This means the device is intended for operation in protective extra-low voltage systems (PELVs).

Fig. 15:
Connection diagram supply voltage

④ Supply voltage



4.2 General notes for electrical installation

All electrical connections of the OLM200 are configured as M12 circular plug-in connectors. Refer to the corresponding connection examples and wiring notes in chapter 4.3.

Information about suitable plugs and cables can be found in section 7.4 “Accessories” on page 42. The connection plugs of the linear measurement sensor OLM200 are compatible with SPEEDCON quick connectors as well as standard M12 screw connectors.

Note It is not possible to use self-made angled plugs/female connectors.

Note Enclosure rating IP 65 is only achieved with screwed connection plugs or using cover caps.

4.3 Wiring notes

Legend for cable groups Fig. 16 to Fig. 18:

1 = Cables very sensitive to interference (analog measuring cables)

2 = Cables sensitive to interference (sensor cables, communication signals, bus cables)

3 = Cable which is a source of interference (control cable for inductive loads, motor brakes)

4 = Cables which are powerful sources of interference (output cables from frequency inverters, feeders to welding systems, power cables)

Fig. 16:
Cables in groups 1, 2 and 3, 4 must be crossed at right angles

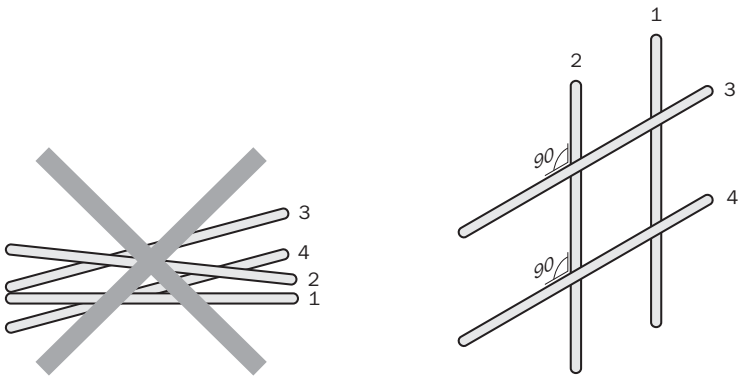


Fig. 17:
Ideal: route cables in different cable channels

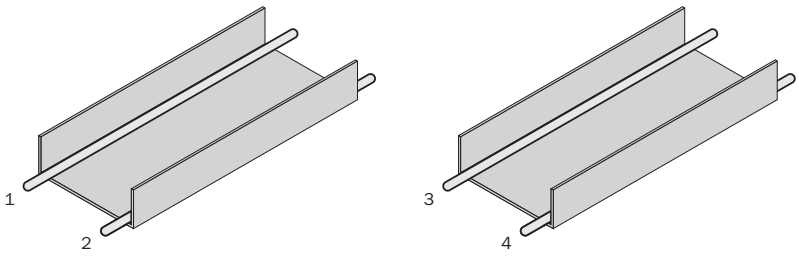


Fig. 18:
Alternative: separate cables with a metallic divider

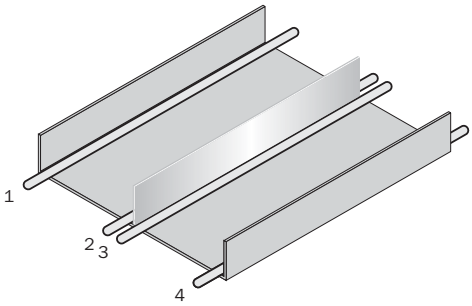


Fig. 19:
No “pigtails”, shield short and connected over the full area, grounding at BOTH ends

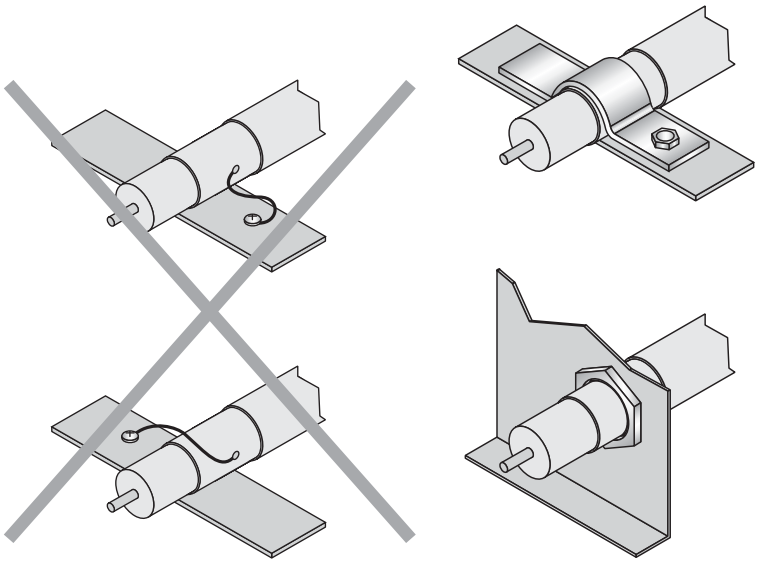
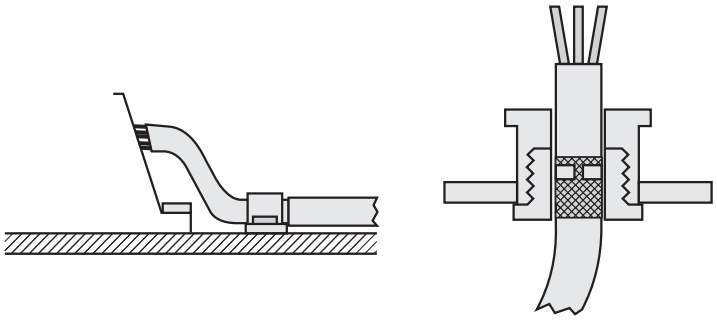


Fig. 20:
Shield connection in plastic housings



5 Commissioning

Apply the sensor to supply voltage (see type label). The operating indicator [power on] and status display [status] must light up green if the bar code tape is aligned correctly.

5.1 Device configuration

Linear measurement sensors OLM200-xxx9 have a PROFINET IO interface. The devices are configured using the device description file GSD. For a description of the PROFINET IO modules for, refer to section 5.3 “PROFIBUS IO interface”.

The device description file GSD can be downloaded from the website at www.mysick.com/en/OLM200.

5.1.1 Import device description file (GSD)

Before you can configure PROFINET IO for the OLM200 PROFINET IO for the first time, you need to import the device description file of the OLM200 into the hardware catalog of the network engineering tool (e.g. SIMATIC-Manager by Siemens).

- Download the GSD file from the website www.mysick.com/en/OLM200.
- Follow the instructions in the online help or user manual of the network engineering tool to import the device description file.

The hardware catalog is displayed in the network engineering tool.

5.1.2 Configuring the participants

Every PROFINET IO field device like, e.g., the OLM200 PROFINET IO, has its own MAC address. The MAC address of the OLM200 PROFINET IO is written on the type label (e.g. 00:06:77:02:00:A7).

Additionally, a PROFINET IO field device requires a unique, plant-specific device name. The device name is used by the IO controller to determine the IP address of the field device.

The IP address is determined in two steps:

- You assume the device name assigned for the OLM200 PROFINET IO by the network engineering tool or you configure a unique plant-specific device name using the network engineering tool.
- The IO controller assigns the IP address based on the device name.

Manual specification of the name and IP address of the OLM200 PROFINET IO:

- Double-click the icon of the OLM200 PROFINET IO in the network engineering tool. The dialogue **Properties** appears.
- Select the tab **general**.
- Enter the device name of the OLM200 PROFINET IO.
- Assign a new IP address.

5.1.3 Parameterization

Note The parameter "Extrapolation time" cannot be parameterized via PROFINET IO. The parameter can be parameterized either via control marks or via SOPAS ET. See page 21, parameter "Extrapolation time".

5.1.4 Factory setting

Note You may use the network engineering tool to reset the sensor to factory settings. Resetting to factory settings renders the IP configuration invalid and the sensor can no longer be contacted in the network. To be able to establish a connection to the sensor, a valid IP configuration must be assigned via the network engineering tool first.

5.2 Ethernet parameter list and factory settings

For service or diagnosis purposes, you may read and set parameters via Ethernet (SOPAS ET).

Note Parameters configured by Ethernet (SOPAS) are overwritten with the PROFINET parameters once the device is integrated into a PROFINET network.

A sensor has the following IP network configuration in its delivery state:

- Static IP address
- IP address: 192.168.100.236
- IP network mask: 255.255.255.0
- Standard gateway: 0.0.0.0

If the system detects an invalid IP network configuration then the delivery-state configuration is used instead.

Note It is necessary to log onto the device as “Maintenance” in order to be able to access certain settings in the following table.

To do this, select “Login Device” in SOPAS (Ctrl + I), select the “Maintenance” user level and enter the password “esick”.

Tab. 2: Ethernet parameter list

Device side	Parameters	Setting options/description
OLM200 Main page	Position, speed, number of marks	Indication only The first two digits of “Number of marks” represent the number of legible marks, the last two the number of detected marks.
Overview	Device name, software version, product code, serial number, part number	Indication only
Diagnostics	Display of the internal temperature, device errors/warnings, signal quality , reading quality	Indication only

Device side	Parameters	Setting options/description
Configuration	Device name (can be set after logging onto the device)	20-character device name (unique assignment of the devices if there are several devices in the network)
	Ethernet MAC address	Indication only
	Store configuration (visible after logging onto the device)	Save device name permanently
Parameter	Device ident number	Indication only
	Ethernet TCP/IP configuration	Indication only Can be modified when establishing a connection via SOPAS ET or a network engineering tool.
	Resolution position value	0.1 mm, **1 mm**, 10 mm, 100 mm
	Measurement offset	**0** ... 10 km (unit mm)
	Measurement preset	**0** ... 10 km (unit mm)
	Function MF2 input	**Off**, preset, Illumination
	MF2, active status	**Active high state**/active low state
	Function MF1 output	Measurement, speed, **service**, control mark, illumination
	MF1 output, active status	**Active high state**/active low state
	MF2 switching threshold, measured value	**0** ... 10 km (unit mm)
	MF1 hysteresis for switching threshold	**1** ... 10 km (unit mm)
	MF1 speed switching threshold	**0** ... 10 m/s (unit mm/s)
	MF1 speed mode	**Direction +**, Direction –, Direction ±
	Configure MF1 on service	Distance out of range, temperature too high/too low, no bar code detected, distance calculation/code reading problems, pollution problems
	Extrapolation time	**160 ms**, 500 ms, 1000 ms, 2000 ms
	Store parameters	Save parameters; reset parameters to factory settings

Device side	Parameters	Setting options/description
Methods	Illumination	**Lighting on**, lighting off
	Restart	**Coldstart:** reinitialization of device hardware and software **Warmstart:** reinitialization of the device software
	Image data (can be used after logging onto the device)	 **ATTENTION** **After execution of this method a coldstart will be necessary!** Update: Current shot is shown as a histogram and stored as a text file under “c:\temp\calibData.txt”

bold = factory default

5.3 PROFIBUS IO interface

The OLM200 with PROFINET IO supports Ethernet networks with a transmission rate of 100 Mbit/s and PROFINET IO / RT, Conformance Class B.

Additionally, the following I&M-functions (Identification & Maintenance Function) are supported:

- IM0 = Device identification (serial number, version number, order number, etc.)
- IM1 = User may enter plant and location mark (AKZ and OKZ)
- IM2 = Installation date
- IM3 = Function description
- IM4 = Signature (config-CRC)

The version number in the I&M function "IM0" describes the version of the PROFINET interface and is not identical with the version number of the sensor firmware.

5.3.1 Nomenclature

A byte is an 8-bit value.

A word is a 16-bit value.

Consistency means that all values within a module are updated simultaneously.

An input value is transmitted cyclically from the device to the master (PLC).

An output value is transmitted cyclically from the master (PLC) to the device.

A configuration value is only transmitted from the master to the device when the PROFINET IO device is switched on.

5.3.2 Description of PROFNETI modules for configuration and I/O data

The linear measurement sensor OLM200 offers various PROFINET modules for flexible adaptation to different control tasks. Different types of module are offered.

- Straightforward input modules that only transmit values to the master and, optionally, can contain configuration data
- Input and output modules that can transmit values to the master as well as receiving values, and can optionally contain configuration data
- Setup modules that only contain configuration data and do not transfer any process data to the master or receive process data from the master

The modules are named according to the following scheme:
<Module number><Name>/<Signature>, <Name>/<Signature>, ...

The module names are read from left to right, and specify without any gaps the values which are transported by the module. A value further to the left is transmitted before a value further to the right in this case, and input and output values count independently of one another.

The signature specifies whether the value is an input or an output value, and how many words or bytes the value contains.
The signature has the following structure: <Direction><Number><Unit>

Direction is:

- “i” for an input value from the device to the master,
- “o” for an output value from the master to the device.

Unit is:

- “b” for bytes and
- “w” for words.

Examples:

- 5-Position/i2w, Preset dyn/o2w
- 13-Temp/i1b, Level/i2b, res/i2b

The first example deals with the module with number 5 which contains two values:

- an input value, two words long, to the master called “Position”, and
- an output value, two words long, from the master to the device called “Preset dyn”.

The second value is module number 13 with 3 values:

- an input value “Temp”, 1 byte long, for “Temperature”,
- an input value “Level”, 2 bytes long, and
- a reserved area 2 bytes long.

Module category “01 Measured values”

Tab. 3: Module category “01 Measured value“

Module no.	Total size	Type	Contents		
			Name	**Type**	**Size/config. possibility**
1	2 words	Input module	Position	Input	2 words
			Resolution of the position value	Configuration	0.1 mm ... 100 mm
2	1 word	Input module	Position	Input	1 word
			Resolution of the position value	Configuration	0.1 mm ... 100 mm
3	2 words	Input module	Speed	Input	2 words
			Resolution of the value	Configuration	0.1 mm/s 100 mm/s
4	4 words	Input module	Position	Input	2 words
			Speed	Input	2 words
			Resolution of the position value	Configuration	0.1 mm ... 100 mm
			Resolution of the speed value	Configuration	0.1 mm/s ... 100 mm/s
5	2 words	Input/output module	Position	Input	2 words
			Dynamic preset value	Edition	2 words
			Resolution of the position and preset value	Configuration	0.1 mm ... 100 mm

Module category “02 Device state”

Tab. 4: Module category “02 Device state“

Module no.	Total size	Type	Contents		
			Name	**Type**	**Size/config. possibility**
10	1 byte	Input module	Status	Input	8 bit
12	4 bytes	Input module	Label	Input	3 bytes
			Reserved	Input	1 byte
13	5 bytes	Input module	Temperature [°C]	Input	1 byte
			Measured value quality	Input	2 byte
			Reserved	Input	2 bytes

Module category “03 Device settings”

Tab. 5: Module category “03 Device settings“

Module no.	Total size	Type	Contents		
			Name	**Type**	**Size/config. possibility**
20	Empty	Setup module	Polarity of output MF1	Parameter	HIGH or LOW
			Function of output MF1	Parameter	position, speed, service, control mark, illumination off
			Position value	Parameter	–10000000 ... 10000000
			Position hysteresis	Parameter	–10000000 ... 10000000
			Speed value	Parameter	–10000 ... 10000
			Speed mode	Parameter	(+), (–), (±)
			Range overrun	Parameter	Switch yes/no
			Temperature overrun	Parameter	Switch yes/no
			No bar code	Parameter	Switch yes/no
			No plausible measured value	Parameter	Switch yes/no
			Pre-failure signal	Parameter	Switch yes/no
21	Empty	Setup module	Polarity of input MF2	Parameter	HIGH or LOW
			Funktion of input MF2	Parameter	Inactive, preset activation, illumination off
22	Empty	Setup module	Static preset-value [mm]	Parameter	–10000000 ... 10000000
			Offset value [mm]	Parameter	–10000000 ... 10000000

Module category “04 Device information”

Tab. 6: Module category “04 Device information“

Module no.	Total size	Type	Contents		
			Name	Type	Size/config. possibility
30	8 bytes	Input module	Serial number	Input	8 characters
31	14 bytes	Input module	Product code	Input	14 characters
32	8 bytes	Input module	Version number of the hardware	Input	8 characters
33	10 words	Input module	Version no. of firmware FPGA	Input	19 characters
34	10 words	Input module	Version number of firmware 1	Input	19 characters
			Reserved	Input	1 byte
35	10 words	Input module	Version number of firmware 2	Input	19 characters
			Reserved	Input	1 byte

5.3.3 Module 1: “Position/i2w”

Type

Input module, 2 words, consistent

Description

This module reads the current position value of the tape according to the offset and resolution settings.

Corresponds to the Class 1 module of the encoder profile

Input values

Rel. address	Type	Description
0	Signed 32-bit number in two's complement	Current position in selected resolution with regard to the offset. Depending on the resolution, one digit corresponds to 0.1 mm ... 100 mm.

Moduleparameter

Name	Value range	Standard value	Description
Resolution	0.1 mm, 1 mm, 10 mm, 100 mm	1 mm	Determines the resolution of the position value

5.3.4 Module 2: “Position/i1w”

Type

Input module, 1 word, consistent

Description

This module reads the current position value of the tape according to the offset and resolution settings, however only as a 16-bit number contrary to module 1.

Corresponds to the optional Class 1 module of the encoder profile.

Notes The actual position value may exceed the value range for this module. In this case, the following cut-off values are output as error value.

If the value is less than –32767 then –32768 (hex 0x8000) is output.

If the value is greater than 32766 then 32767 (hex 0x7FFF) is output.

If there is no valid measured value due to a device error, a missing bar code tape or contamination then the value “0” is output for the position and the corresponding bits are set in the status byte, see section 5.3.8 “Module 10: “Status/i1b”” on page 30.

Input values

Rel. address	Type	Description
0	Signed 16-bit number in two's complement (tipped)	Current position in selected resolution with regard to the offset. Depending on the resolution, one digit corresponds to 0.1 mm ... 100 mm.

Moduleparameter

Name	Value range	Standard value	Description
Resolution	0.1 mm, 1 mm, 10 mm, 100 mm	1 mm	Determines the resolution of the position value

5.3.5 Module 3: “Speed/i2w”

Type

Input module, 2 words, consistent

Description

This module reads the current speed according to the selected resolution.

Notes If there is no valid measured value due to a device error, a missing bar code tape or contamination then the value “0” is output for the speed and the corresponding bytes in the status byte are set, see section 5.3.8 “Module 10: “Status/i1b”” on page 30.

Input values

Rel. address	Type	Description
0	Signed 32-bit number in two's complement	Current speed in selected resolution. Depending on resolution, one digit corresponds to 0.1 mm/s ... 100 mm/s.

Moduleparameter

Name	Value range	Standard value	Description
Resolution	0.1 mm/s, 1 mm/s, 10 mm/s, 100 mm/s	1 mm/s	Determines the resolution of the speed value.

5.3.6 Module 4: “Position/i2w, Speed/i2w”

Type

Input module, 4 words, consistent

Description

This module reads both the current position and the current speed in accordance with the selected resolution and offset.

Notes If there was no valid measured value due to a device error, a missing bar code tape or contamination then the value “0” is output both for the position and the speed, and the corresponding bits in the status byte are set, see section 5.3.8, “Module 10: “Status/i1b”” on page 30.

Input values

Rel. address	Type	Description
0	Signed 32-bit number in two's complement	Current position in selected resolution with regard to the offset. Depending on the resolution, one digit corresponds to 0.1 mm ... 100 mm.
4	Signed 32-bit number in two's complement	Current speed in selected resolution Depending on the resolution, one digit corresponds to 0.1 mm/s ... 100 mm/s.

Moduleparameter

Name	Value range	Standard value	Description
Position resolution	0.1 mm, 1 mm, 10 mm, 100 mm	1 mm	Determines the resolution of the position value
Speed resolution	0.1 mm/s, 1 mm/s, 10 mm/s, 100 mm/s	1 mm/s	Determines the resolution of the speed value.

5.3.7 Module 5: “Position/i2w, Preset dyn/o2w”

Type

Input/output module, 2 words, consistent

Description

This value reads the current position value of the bar code tape according to the resolution settings. Any active dynamic preset or offset is included in the calculation.

When the module is written, the preset value is changed and the preset function can be called up if the most significant bit (bit 31) has been set.

Notes

The preset value is loaded into the device every time the module is transmitted to the device, even if bit 31 has not been set. This can be used for specifying the preset value if there are several calibration positions present on the section, and the MF input is used for triggering the preset function.

A preset or offset value changed by this module is not permanently adopted, and is lost when the device is deactivated.

If there is no valid measured value due to a device error, a missing bar code tape or contamination then the value “0” is output for the position and the corresponding bits are set in the status byte, see section 5.3.8 “Module 10: “Status/i1b”” on page 30.

Input values

Rel. address	Type	Description
0	Signed 32-bit number in two's complement	Current position in selected resolution with regard to the offset. Depending on the resolution, one digit corresponds to 0.1 mm ... 100 mm.

Output values

Rel. address	Type	Description
0.31	Bit, 0 or 1	If bit 31 is not set (0) then the value is adopted in bits 0 ... 30 as the new preset value, although the offset is not recalculated. The output position value is not influenced. If bit 31 has been set (1) then the value is also adopted in bits 0 ... 30 as a new preset value, but in this case the preset function is called up as well. This function adapts the offset so that the preset value is output at the current position from now on.
0.0 ... 0.30	Signed 31-bit number in two's complement	New preset value in selected resolution. Depending on resolution, one digit corresponds to 0.1 mm to 100 mm.

 © SICK AG • Advanced Industrial Sensors • Germany • Subject to change without notice

Moduleparameter

Name	Value range	Standard value	Description
Resolution	0.1 mm, 1 mm, 10 mm, 100 mm	1 mm	Determines the resolution of the position and preset value

5.3.8 Module 10: “Status/i1b”

Type

Input module, 1 byte

Description

This module reads out the status byte of the device.

Input values

Rel. address	Type	Description
0.0	1 bit	No operational status: – If set (1) then no measured value (position or speed) can be read. – If not set (0) then the current measured value is valid.
0.1	1 bit	Device error: – If set (1) then the temperature is outside the permitted range or the sensor is dirty.
0.2	1 bit	Measurement error: – If set (1) then there is no plausible measured value present or the sensor cannot detect a bar code tape.
0.3	1 bit	Pre-failure error: – If set (1) then the sensor is dirty or the integrated lighting is approaching the maximum service life. However, measured values can still be read.
0.4	1 bit	LED off: – If set then the internal lighting is switched off.
0.6	1 bit	MF2: – If set then there is an active level present after debouncing on input MF2.
0.7	1 bit	MF1: – If set then output MF1 has been activated.

5.3.9 Module 12: “Label/i3b”, “res/1b”

Type

Input module, 4 bytes, consistent

Description

This module outputs the last control mark read from the bar code tape.

Notes

If no control mark has been read yet then the read value for the label is 0x00,0x00,0x00.

The most recently read value of the control mark is repeatedly output until a new control mark has been read.

It is not possible to differentiate between several identical control marks that are in direct succession. We recommend cancelling each control mark by means of another control mark.

Input values

Rel. address	Type	Description
0	3 bytes	Content of the control mark
3	1 byte	Reserved

5.3.10 Module 13: “Temp/i1b, Level/i2b, res/i2b”

Type

Input module, 5 bytes, consistent

Description

This module can be used for reading diagnostic data from the device.

Input values

Rel. address	Type	Description
0	Signed 8-bit number in two's complement	Device temperature [°C]
1	Unsigned 16-bit number in two's complement	Device-specific value for the quality of the measured value. Higher values mean poorer quality.
3	2 byte	Reserved

5.3.11 Module 20: “MF1 Output Q”

Type

Setup module, no input/output data

Description

This module defines the behavior of output Q.

Moduleparameter

Name	Value range	Standard value	Description
Active level	HIGH, LOW	high	Active switching level of the output.
Function	position, speed, service, control mark, illumination off	service	Function of the output: “position”: Output switches if the position from the module-parameter “Position threshold” has been exceeded. “speed”: Output switches if the speed limit from the module-parameter “speed threshold” has been exceeded in the direction specified by “speed mode”. “service”: The output switches if at least one of the switched-on service bits has been set. “control mark”: The output switches according to the special switch-on and switch-off control marks (q. v.). “illumination off”: The output switches when the integrated lighting is switched off.
Position threshold	–10,000,000 mm ... 10,000,00 mm	0 mm	Value of the position threshold in [mm].
Position hysteresis	–10,000,000 mm ... 10,000,00 mm	10 mm	Hysteresis of the position threshold in [mm].
Speed threshold	0 mm/s ... 10,000 mm/s	0 mm/s	Speed threshold in [mm/s].
Speed sign	(+) positive direction, (–) negative direction, (+/–) both directions	(+) positive direction	Mode for detecting the speed overrun.
Service position out of range	disabled, enabled	enabled	If “enabled”, the output switches if the position leaves the permitted range of –10 km ... 10 km.

Name	Value range	Standard value	Description
Service temperature failure	disabled, enabled	enabled	If “enabled”, the output switches if the device temperature is outside the permitted range.
Service no bar code visible	disabled, enabled	enabled	If “enabled”, the output switches if no bar code tape is detected.
Service no plausible position	disabled, enabled	enabled	If “enabled”, the output switches if no plausible measured value is present any longer.
Service pre-failure	disabled, enabled	enabled	If “enabled”, the output switches if the pre-failure status (sensor dirty or lighting approaching service life limit) has been active.

5.3.12 Module 21: “MF2 Input”

Type

Setup module, no input/output data

Description

This module defines the behavior of the multi-function input MF.

Moduleparameter

Name	Value range	Standard value	Description
Active level	HIGH, LOW	high	Input level that is interpreted as active.
Function	inactive, preset activation, illumination off	inactive	Function of the input: “inactive”: An active signal at the input does not trigger a response. “preset activation”: The preset function is activated via the input. “illumination off”: The integrated lighting can be deactivated via the input

5.3.13 Module 22: “Preset stat and Offset”

Type

Setup module, no input/output data

Description

This module is used for presetting the preset value and the initial position offset.

Note If module 5 is also active then the parameter data of module 22 is overwritten by the output data from module 5.

Moduleparameter

Name	Value range	Standard value	Description
Position preset	–10,000,000 mm ... 10,000,000 mm	0 mm	Defines the initial preset value in [mm].
Position offset	–10,000,000 mm ... 10,000,000 mm	0 mm	Defines the initial position offset in [mm].

5.3.14 Module 30: “Serial no/i8b”

Type

Input module, 8 bytes

Description

The serial number of the device can be interrogated using this module.

Input values

Rel. address	Type	Description
0	8 ASCII characters	Serial number, unused characters at the end of the string are filled with 0 bytes (0x00).

5.3.15 Module 31: “Product code/i14b”

Type

Input module, 14 bytes

Description

This module can be used for interrogating the product code of the device.

Input values

Rel. address	Type	Description
0	14 ASCII characters	String in the format OLM200-xxxx. Unused characters at the end of the string are filled with 0 bytes (0x00).

5.3.16 Module 32: “Version HW/i8b”

Type

Input module, 8 bytes

Description

This module can be used for interrogating the version number of the device hardware.

Input values

Rel. address	Type	Description
0	8 ASCII characters	Hardware version number

5.3.17 Module 33: “Version FPGA/i10w”

Type

Input module, 10 words

Description

This module can be used for interrogating the FPGA firmware version number of the device.

Corresponds to the SOPAS Firmware Component “Board0/Component2”.

Note If this value is not present in the device then a zero byte (0x00is transmitted for each character.

Input values

Rel. address	Type	Description
0	19 ASCII characters	String in the format V000.000.000.000000. Unused characters at the end of the string are filled with 0 bytes (0x00).
19	1 byte	Reserved

5.3.18 Module 34: “Version µC/i10w”

Type

Input module, 10 words

Description

This module can be used for interrogating the firmware version number of the main controller of the device.

Corresponds to the SOPAS Firmware Component “Board0/Component0”.

Note If this value is not present in the device then a zero byte (0x00is transmitted for each character.

Input values

Rel. address	Type	Description
0	19 ASCII characters	String in the format V000.000.000.000000. Unused characters at the end of the string are filled with 0 bytes (0x00).
19	1 byte	Reserved

5.3.19 Module 35: “Version µC2/i10w”

Type

Input module, 10 words

Description

This module can be used for interrogating the firmware version number of the communication controller in the device.

Corresponds to the SOPAS Firmware Component “Board1/Component0”.

Note If this value is not present in the device then a zero byte (0x00) is transmitted for each character.

Input values

Rel. address	Type	Description
0	19 ASCII characters	String in the format V000.000.000.000000. Unused characters at the end of the string are filled with 0 bytes (0x00).
19	1 byte	Reserved

6 Maintenance

The linear measurement sensor OLM200 is maintenance-free.

We recommend regularly doing the following:

- Clean the optical interfaces.
- Check the screw connections and plug connections.

Note Do not clean the bar code tape using continuously travelling cleaning devices, since this will impair the reading quality.

7 Technical data

7.1 Data sheet OLM200 – PROFINET IO – PROFINET IO

Tab. 7: Data sheet OLM200 – PROFINET IO

Performance

Repeatability [1]	0.15 mm
Output rate	2.5 ms
Response time [2]	10 ms
Light source	LED, red
Measurement length of the distance moved [3]	0 m ... 10,000 m
Service life [4]	100,000 h
MTTFd	> 100 years
Accuracy of speed output	± 5 mm/s
Maximum speed	10 m/s

[1] Statistical error 3 σ, no warm-up time required.
[2] Response time of switching output
[3] Dependent on the set resolution and transfer protocol.
[4] Typ. At +25 °C.

Interfaces

Data interface	PROFINET IO / RT, Conformance Class B, PN specification V2.25
Switching output [1]	Multifunctional output MF1: PNP, MF1: NPN
Output current I_A [2]	100 mA
Switching input	Multifunctional input MF2
Data transmission rate	100 Mbit/s fullduplex

[1] Functions of switching output MF1: Position speed; control mark Q00 (off), Q01 (on); illumination on/off; service [prefailure (dirt/LED life time), no bar code tape, over/under temperature, out of range 0 km > position > 10 km, internal error].
[2] Outputs MF1 short-circuit protected.

Mechanics/electrics

Supply voltage V_S [1]	DC 18 V ... 30 V
Ripple [2]	≤ 5 V_{SS}
Power consumption	< 5.5 W
Initialization time	10 s
Housing material	Aluminum, zinc
Weight	Approx. 510 g

[1] Limit values, reverse polarity protected.
[2] May not exceed or fall short V_s tolerances.

Ambient data

Enclosure rating	IP 65 (EN 60 529)
Protection class	III
EMC	EN 61000-6-2, EN 61000-6-4
Ambient temperature [1), 2)]	Operation: –30 °C ... +60 °C Storage: –40 °C ... +75 °C
Typ. ambient light safety [3)]	≤ 30,000 lx
Vibration	DIN/EN 60068-2-6, DIN/EN 60068-2-64
Shock	DIN/EN 60068-2-27

1) –30 °C with 30 min. warm-up time.
2) Max. 95 % humidity, non-condensing.
3) Typ. value at +25 °C ambient temperature.

Type-specific data

Interface	Bar code tape reading distance	Bar code width	Type designation	Part no.
PROFINET IO	100 mm ± 20 mm [1)]	30 mm	OLM200-1009	1058126

1) A reading distance greater than 85 mm must be maintained in order to ensure an optimum functional reserve in applications in which a bar code is sporadically covered.

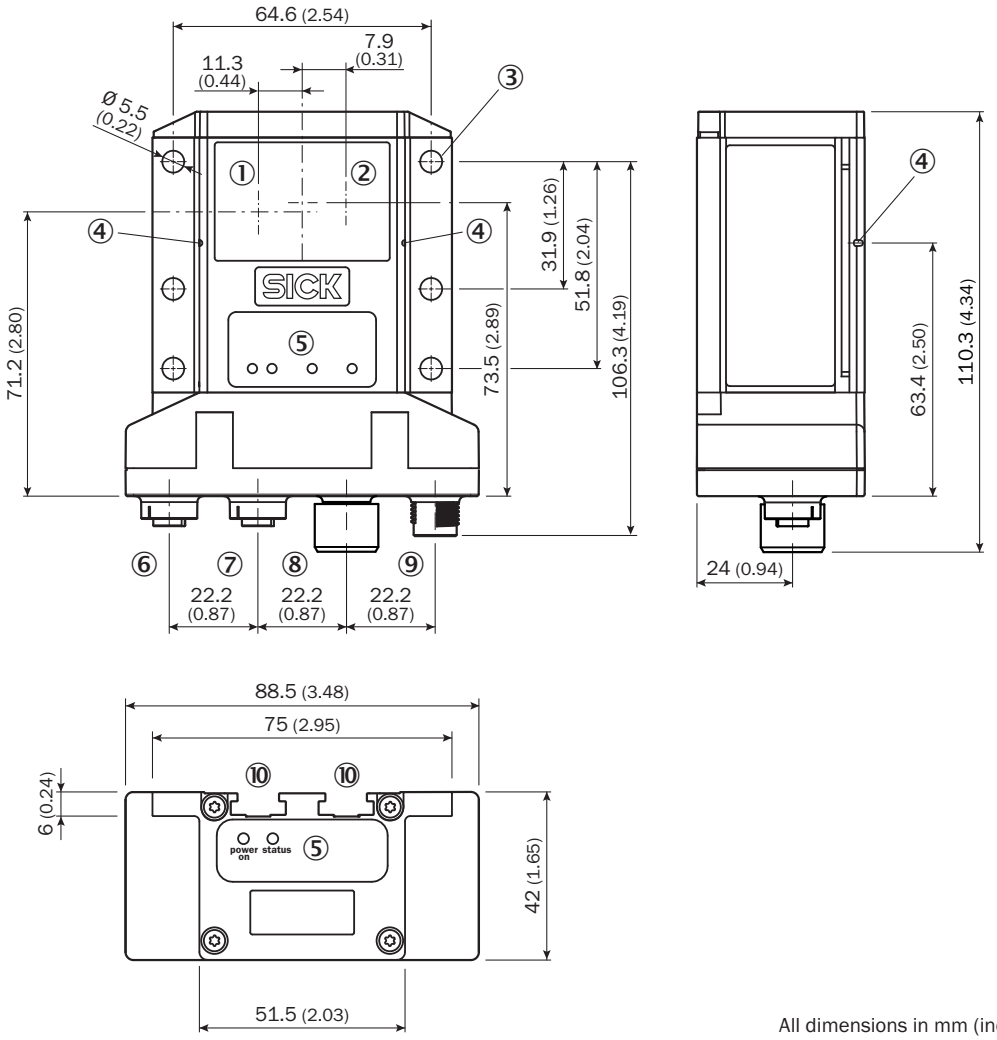
7.2 Data sheet bar code tape

Tab. 8:
Bar code tape data sheet

Upper material	White, matt polyester foil, silicone-free
Foil thickness acc. to ISO 534	56 µm ± 10 %
Upper material thickness incl. adhesive	approx. 102 µm
Tearing strength acc. to ISO 1184	> 150 N/15 mm
Adhesive	Permanent adhesive on the basis of modified acrylates. Suitable for problem substrates.
Adhesive force (adhesive force level T acc. to DIN 30646, measured on stainless steel, checked to FTM 1*/after 24 h):	
– Steel	> 9.3 N/10mm
– Aluminum	> 8.0 N/10mm
– Polypropylene	> 6.2 N/10mm
– HD polyethylene	> 4.3 N/10mm
– Smooth powder paint	> 7.8 N/10mm
Min. adhesion temperature	> +4 °C
Temperature resistance	–40 °C ... +150 °C
Chemical resistance	Resistant to most oils and greases, fuels, aliphatic solvents and dilute acids
Load test (glued onto stainless steel):	No complaint:
– Relative air humidity 98 %	120 h at 38 °C
– Diesel oil	4 h at 23 °C
– Glass cleaner	4 h
– Isopropyl alcohol	4 h
– Brake fluid DOT 4	4 h
– Heptane	4 h
– Engine oil SAE 15W40	4 h
– Toluol	4 h
– Industrial cleaner	4 h
– Kerosene (US), paraffin (GB)	4 h
– Washing-up liquid	24 h
– Salt spray test acc. to DIN 50021 SS	150 h
– Climatic stress acc. to DIN 50018 SFW 2.0	No change after 2 load cycles
Base corrosion	No corrosion on the glued base
Dimensional stability	Key figure 02 (checked to DIN 30646) Shrinkage < 0.2 %

7.3 Dimensional drawing

Fig. 21:
Dimensional drawing
OLM200



All dimensions in mm (inch)

① Center of sender optical axis
② Center of receiver optical axis
③ Mounting hole
④ Alignment aid (slot)
⑤ Status LEDs
⑥ Ethernet/PROFINET IO, socket M12, 4-pin
⑦ Ethernet/PROFINET IO, socket M12, 4-pin
⑧ Not connected
⑨ Device connection, plug M12, 5-pin
⑩ T-Nut

7.4 Accessories

7.4.1 Plug connectors and cables

Tab. 9: Female connectors with cable

Female connectors, M12, 5-pin		
Description	**Type**	**Part no.**
Female connector, M12, 5-pin, straight, 2 m, PVC	DOL-1205-G02M	6008899
Female connector, M12, 5-pin, straight, 5 m, PVC	DOL-1205-G05M	6009868
Female connector, M12, 5-pin, straight, 10 m, PVC	DOL-1205-G10M	6010544

Tab. 10: PROFINET IO male connector with cable

PROFINET IO male connectors with cable		
Description	**Type**	**Part no.**
Male connector, M12, 4-pin, straight, 2 m, D-coded, PROFINET, to connector M12 straight	SSL-1204-G02MZ90	6048241
Male connector, M12, 4-pin, straight, 5 m, D-coded, PROFINET, to connector M12 straight	SSL-1204-G05MZ90	6048242
Male connector, M12, 4-pin, straight, 10 m, D-coded, PROFINET, to connector M12 straight	SSL-1204-G10MZ90	6048243
Male connector, M12, 4-pin, straight, 2 m, D-coded, PROFINET, to connector RJ-45	SSL-2J04-G02MZ60	6048244
Male connector, M12, 4-pin, straight, 5 m, D-coded, PROFINET, to connector RJ-45	SSL-2J04-G05MZ60	6048245
Male connector, M12, 4-pin, straight, 10 m, D-coded, PROFINET, to connector RJ-45	SSL-2J04-G10MZ60	6048246
Male connector, M12, 4-pin, straight, 2 m, D-coded, PROFINET, to open end	STL-1204-G02MZ90	6048247
Male connector, M12, 4-pin, straight, 5 m, D-coded, PROFINET, to open end	STL-1204-G05MZ90	6048248
Male connector, M12, 4-pin, straight, 10 m, D-coded, PROFINET, to open end	STL-1204-G10MZ90	6048249
Male connector, M12, 4-pin, angled, 2 m, D-coded, PROFINET, to connector M12 straight	STL-1204-F02MZ90	6048250
Male connector, M12, 4-pin, angled, 5 m, D-coded, PROFINET, to connector M12 straight	STL-1204-F05MZ90	6048251
Male connector, M12, 4-pin, angled, 10 m, D-coded, PROFINET, to connector M12 straight	STL-1204-F10MZ90	6048252
Male connector, M12, 4-pin, angled, 2 m, D-coded, PROFINET, to connector RJ-45	SSL-1204-F02MZ90	6048253
Male connector, M12, 4-pin, angled, 5 m, D-coded, PROFINET, to connector RJ-45	SSL-1204-F05MZ90	6048254
Male connector, M12, 4-pin, angled, 10 m, D-coded, PROFINET, to connector RJ-45	SSL-1204-F10MZ90	6048255
Cable plug, M12, 4-pin, angled, 2 m, D-coded, PROFINET, to open end	STL-1204-W02MZ90	6048256
Male connector, M12, 4-pin, angled, 5 m, D-coded, PROFINET, to open end	STL-1204-W05MZ90	6048257
Male connector, M12, 4-pin, angled, 10 m, D-coded, PROFINET, to open end	STL-1204-W10MZ90	6048258
Male connector, M12, 4-pin, angled, 25 m, D-coded, PROFINET, to open end	STL-1204-W25MZ90	6048259

Tab. 11: PROFINET IO male and female connector without cable

PROFINET IO male connectors and female connectors without cable		
Description	**Type**	**Part no.**
Male connector, RJ 45, customizable, IP20	STE-0J04-GZ	6048260
Male connector, M12, straight, customizable, IP65	STE-1204-GZ	6048261
Male connector, M12, angled, customizable, IP65	STE-1204-WZ	6048262
Female connector, M12, straight, customizable, IP65	DOS-1204-GZ	6048263
Female connector, M12, angled, customizable, IP65	DOS-1204-WZ	6048264

Tab. 12: Wall penetration

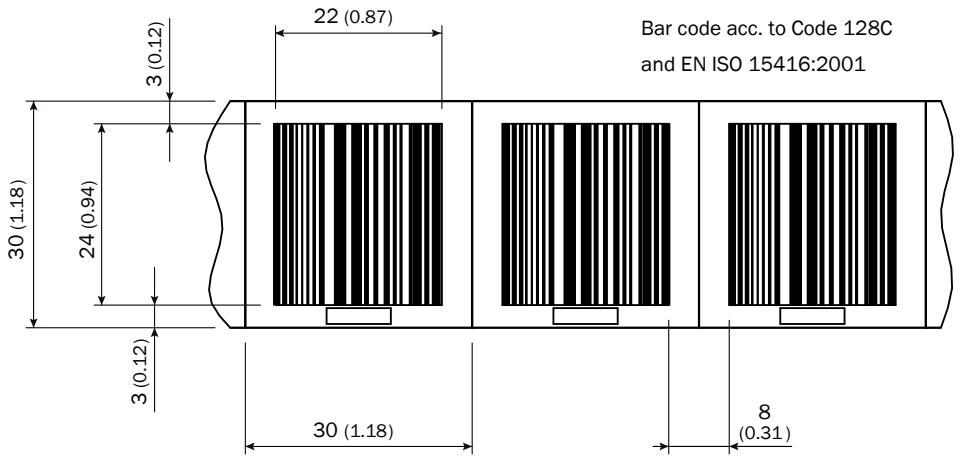
Wall penetration		
Description	**Type**	**Part no.**
Wall penetration, RJ-45, angled, D-coded	DOS-RJ45 Passage female connector	6048180

7.4.2 Bar code tape

The SICK bar code tape is available in heights of 30 mm and 40 mm. The width of the bar code is always 30 mm. The coding of the bar code tape is 128C, acc. to EN ISO 15416:2001.

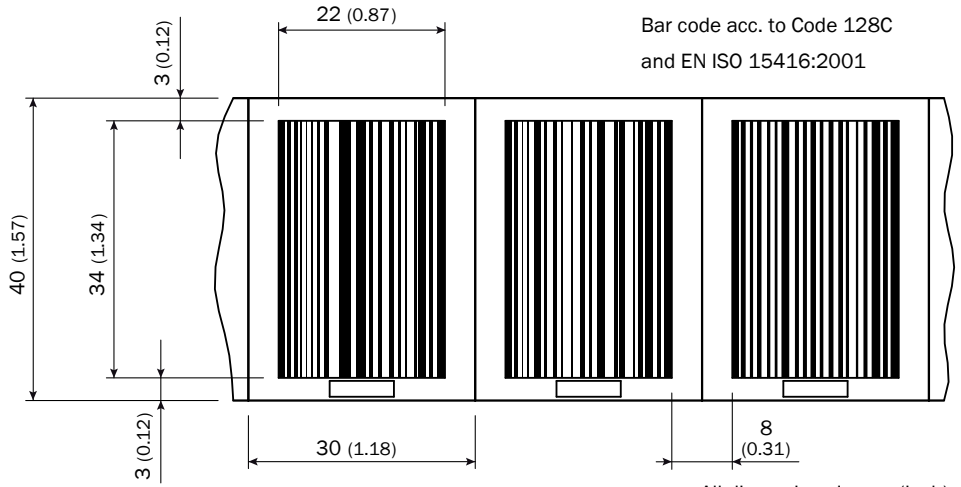
Information about correct mounting of the bar code tape can be found in section 3.1 “Bar code tape mounting”.

Bar code tape, height 30 mm, width 30 mm



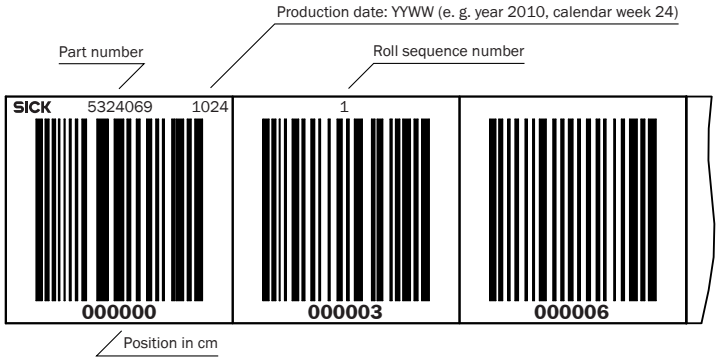
All dimensions in mm (inch)

Bar code tape, height 40 mm, width 30 mm



All dimensions in mm (inch)

7.4.3 Bar code tape printing



7.4.4 Order notes and variants of the bar code tape

The bar code tape is available with a measuring range up to 500 m, in lengths of 20 m per roll, from stock. Measuring ranges that exceed 500 m or which cannot reasonably be represented with the available 20 m sections can be produced for specific customer orders. In measuring ranges greater than 500 m, we recommend ordering the entire measuring range as a bar code tape produced for a specific customer order.

Tab. 13: Bar code tape accessories

Bar code tape with 30 mm height					
Measuring range in meters		**Roll sequence number**	**Code Start**	**Code End**	**Part no.**
from	**to**				
0	20	1	000000	002001	5324069
20	40	2	002004	004002	5324070
40	60	3	004005	006000	5324071
60	80	4	006003	008001	5324072
80	100	5	008004	010002	5324073
100	120	6	010005	012000	5324074
120	140	7	012003	014001	5324075
140	160	8	014004	016002	5324076
160	180	9	016005	018000	5324077
180	200	10	018003	020001	5324077
200	220	11	020004	022002	5324079
220	240	12	022005	024000	5324080
240	260	13	024003	026001	5324081
260	280	14	026004	028002	5324082
280	300	15	028005	030000	5324083
300	320	16	030003	032001	5324084
320	340	17	032004	034002	5324085
340	360	18	034005	036000	5324086
360	380	19	036003	038001	5324087
380	400	20	038004	040002	5324088
400	420	21	040005	042000	5324205
420	440	22	042003	044001	5324206

Bar code tape with 30 mm height					
Measuring range in meters		Roll sequence number	Code Start	Code End	Part no.
from	to				
440	460	23	044004	046002	5324207
460	480	24	046005	048000	5324208
480	500	25	048003	050001	5324209

Special lengths with height 30 mm					
Measuring range in meters		Roll sequence number	Code Start	Code End	Part no.
from	to				
0	5	1	000000	000501	5324252

Bar code tape with 40 mm height					
Measuring range in meters		**Roll sequence number**	**Code Start**	**Code End**	**Part no.**
from	**to**				
0	20	1	000000	002001	5324090
20	40	2	002004	004002	5324091
40	60	3	004005	006000	5324092
60	80	4	006003	008001	5324093
80	100	5	008004	010002	5324094
100	120	6	010005	012000	5324095
120	140	7	012003	014001	5324096
140	160	8	014004	016002	5324097
160	180	9	016005	018000	5324098
180	200	10	018003	020001	5324099
200	220	11	020004	022002	5324100
220	240	12	022005	024000	5324101
240	260	13	024003	026001	5324102
260	280	14	026004	028002	5324103
280	300	15	028005	030000	5324104
300	320	16	030003	032001	5324105
320	340	17	032004	034002	5324106
340	360	18	034005	036000	5324107
360	380	19	036003	038001	5324108
380	400	20	038004	040002	5324109
400	420	21	040005	042000	5324210
420	440	22	042003	044001	5324211
440	460	23	004004	046002	5324212
460	480	24	046005	048000	5324213
480	500	25	048003	050001	5324214

Special lengths with height 40 mm					
Measuring range in meters		**Roll sequence number**	**Code Start**	**Code End**	**Part no.**
from	**to**				
0	5	1	000000	000501	5324251

© SICK AG • Advanced Industrial Sensors • Germany • Subject to change without notice

Bar code tape	Part no.	Description
Width 30/height 30 mm [1)]	5322556	Bar code tape with measuring range printed to customer-specific length. Tape height = 30 mm/minimum length = 20 m Delivery on rolls with max. 20 m length per roll
Width 30/height 40 mm [1)]	5323951	Bar code tape with measuring range printed to customer-specific length. Tape height = 40 mm/minimum length = 20 m Delivery on rolls with max. 20 m length per roll

Instruction for calculating the start and end code for customer-specific lengths

1. Determine the value of the start and end position of your measurement range in centimeters. Devide this value by 3!
2. For start-code: round down the result of “1. ” to the next full number.
   For end-code: round up the result of “1. ” to the next full number.
3. Take the result of “2. ” and multiply it by 3. The result is the start/end code.

Example:

Start position of measurement range = 251 cm

1. 251/3 = 83.667 (divide by 3)
2. 83.667 → 83 (round down to next full number)
3. 83 x 3 = 249 (multiply by 3)

   Start code = 249 cm

End position of measurement range = 986 cm

1. 986/3 = 328.667 (divide by 3)
2. 328.667 → 329 (round up to next full number)
3. 329 x 3 = 987 (multiply by 3)

   End code = 987 cm

[1)] Minimum length is 20 m in one section. The measuring range including start and finish code must be entered for a customer-specific measuring range!

7.4.5 Bar code tape repair kit

PDF files with position codes are available on the website at www.mysick.com/en/OLM200. This means individual codes can be printed independently if necessary, for example in order to replace damaged segments.

The position codes can be located by clicking the products link on the website and selecting the product type in question.

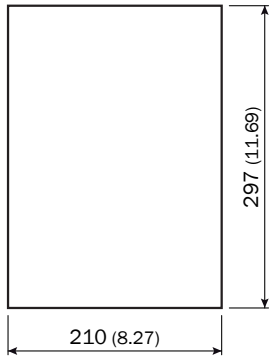
The position codes can be printed out using a laser printer. Note the following points when doing this:

- A4 paper format
- Resolution set as high as possible – ideally 1200 dpi
- Automatic page feed and scaling deactivated

7.4.6 Blank labels for repair codes or control marks

Tab. 14: Blank labels

Blank labels, self-adhesive, DIN-A4, 10x	
Type	**Part no.**
BES-A4-OLM	2059180

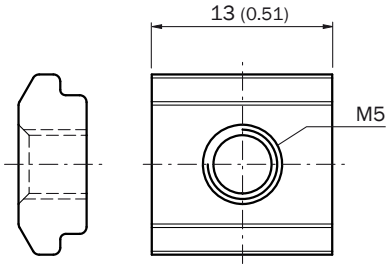


All dimensions in mm (inch)

7.4.7 Sliding nuts

Tab. 15: Sliding nuts

Sliding nuts, M5	
Type	**Part no.**
Set of sliding nuts (4x)	2017550



All dimensions in mm (inch)

8 Error tables and countermeasures

8.1 Device errors and warnings

Tab. 16: Device errors and warnings

Error/Warnings	LED indication	Cause	Possible measure
F1 Error: Temperature too high/too low	Power LED: red Status LED: off	Ambient temperature too high. Ambient temperature too low.	Reduce ambient temperature. Wait for heating-up phase (at temperatures ≤ −20 °C).
F3 Error: no bar code tape detected	Power LED: green Status LED: red	Bar code tape is nonexistent. Bad orientation of the sensor. Sensor or bar code tape totally dirty. Working distance too small/too large.	Mount bar code tape in front of the sensor. Align Sensor with the bar code tape. Clean the optical interfaces of the sensor and the bar code tape. Check distance from sensor to bar code tape.
F4 Error: distance calculation/code reading problem	Power LED: green Status LED: red	Bar code orientation not recognized. Damaged bar code strip	Interrupt the power supply or send cold start command. Renew bar code tape.
F5 Warning: pollution problem	Power LED: green Status LED: flashing red	Sensor or bar code tape dirty. LED sender power inadequate.	Clean the optical interfaces of the sensor and the bar code tape. Replace sensor.
F7 Error: distance out of range	Power LED: green Status LED: red	Calculated position value less than 0 or greater than 10 km.	Modify the value range of the attached bar code tape accordingly.

8.2 Communication error

8.2.1 Ethernet errors

The LED LINK signals the Ethernet condition:

Tab. 17: Ethernet errors

LINK	Condition
Off	Condition right after activation or no physical change present.
Lit green	Ethernet connection is present.
Orange flashing:	Ethernet connection is present and data are exchanged.

8.2.2 PROFINET IO errors

The LEDs BF and SF signal the PROFINET IO condition:

Tab. 18: PROFINET IO errors

BF (red)	SF (red)	Condition	Remedies
Off	On	Status right after switching on	–
On	On	The PROFINET IO interface was activated but no PROFINET IO master has connected to it yet.	Check network settings. Ensure that a valid IP configuration is present. Also see section 5.1.4.
Off	Off	The device was integrated into a bus and may exchange data.	–
Flashes	On	Bus error present	Check cabling Check function master (PLC).

© SICK AG • Advanced Industrial Sensors • Germany • Subject to change without notice

9 Repair

9.1 Repair barcode tape

Note A damaged bar code tape can be repaired. Files containing bar codes are available for download from www.mysick.com/en/OLM200 for this purpose.

These can be printed out on self-adhesive DIN-A4 blank labels (see section 7.4 “Accessories”) using a laser printer and cut to size. The printout must be made with at least 600 dpi and without any page or size adaptation.

10 Appendix

10.1 List of figures

Fig. 1: Type plate 8
Fig. 2: Schematic representation of the mode of function OLM200 9
Fig. 3: Example for roll 1, measuring range 0 to 20 m 10
Fig. 4: Cut mark of the bar code tape 11
Fig. 5: Gap in the cut-open bar code tape 11
Fig. 6: Vertical bar code tape mounting 12
Fig. 7: Tangential distance L when cornering 12
Fig. 8: Minimum curve radius R_{min} depending on the tangential distance L 13
Fig. 9: Vertical curves 13
Fig. 10: Mounting distances OLM200 14
Fig. 11: Vertical alignment OLM200 15
Fig. 12: Field of view of the OLM200 15
Fig. 13: Connections of the OLM200 PROFINET IO 16
Fig. 14: *Connection diagram Ethernet* 16
Fig. 15: *Connection diagram supply voltage* 17
Fig. 16: Cables in groups 1, 2 and 3, 4 must be crossed at right angles 17
Fig. 17: Ideal: route cables in different cable channels 18
Fig. 18: Alternative: separate cables with a metallic divider 18
Fig. 19: No “pigtails”, shield short and connected over the full area, grounding at BOTH ends 18
Fig. 20: Shield connection in plastic housings 18
Fig. 21: Dimensional drawing OLM200 41

10.2 List of tables

Tab. 1: Device designation 7
Tab. 2: Ethernet parameter list 20
Tab. 3: Module category “01 Measured value“ 24
Tab. 4: Module category “02 Device state“ 24
Tab. 5: Module category “03 Device settings“ 25
Tab. 6: Module category “04 Device information“ 26
Tab. 7: Data sheet OLM200 – PROFINET IO 38
Tab. 8: Bar code tape data sheet 40
Tab. 9: Female connectors 42
Tab. 10: PROFINET IO male connector with cable 42
Tab. 11: PROFINET IO male and female connector without cable 43
Tab. 12: Wall penetration 43
Tab. 13: Bar code tape accessories 45
Tab. 14: Blank labels 49
Tab. 15: Sliding nuts 49
Tab. 16: Device errors and warnings 50
Tab. 17: Ethernet errors 51
Tab. 18: PROFINET IO errors 51

8014962/2012-04-26 · (2012-04) · A4 sw int37

Australia
Phone +61 3 9497 4100
1800 334 802 – tollfree
E-Mail sales@sick.com.au

Belgium/Luxembourg
Phone +32 (0)2 466 55 66
E-Mail info@sick.be

Brasil
Phone +55 11 3215-4900
E-Mail sac@sick.com.br

Canada
Phone +1(952) 941-6780
1 800-325-7425 – tollfree
E-Mail info@sickusa.com

Ceská Republika
Phone +420 2 57 91 18 50
E-Mail sick@sick.cz

China
Phone +852-2763 6966
E-Mail ghk@sick.com.hk

Danmark
Phone +45 45 82 64 00
E-Mail sick@sick.dk

Deutschland
Phone +49 211 5301-301
E-Mail kundenservice@sick.de

España
Phone +34 93 480 31 00
E-Mail info@sick.es

France
Phone +33 1 64 62 35 00
E-Mail info@sick.fr

Great Britain
Phone +44 (0)1727 831121
E-Mail info@sick.co.uk

India
Phone +91–22–4033 8333
E-Mail info@sick-india.com

Israel
Phone +972-4-999-0590
E-Mail info@sick-sensors.com

Italia
Phone +39 02 27 43 41
E-Mail info@sick.it

Japan
Phone +81 (0)3 3358 1341
E-Mail support@sick.jp

Magyarország
Phone +36 1 371 2680
E-Mail office@sick.hu

Nederlands
Phone +31 (0)30 229 25 44
E-Mail info@sick.nl

Norge
Phone +47 67 81 50 00
E-Mail austefjord@sick.no

Österreich
Phone +43 (0)22 36 62 28 8-0
E-Mail office@sick.at

Polska
Phone +48 22 837 40 50
E-Mail info@sick.pl

România
Phone +40 356 171 120
E-Mail office@sick.ro

Russia
Phone +7 495 775 05 30
E-Mail info@sick.ru

Schweiz
Phone +41 41 619 29 39
E-Mail contact@sick.ch

Singapore
Phone +65 6744 3732
E-Mail admin@sicksgp.com.sg

South Africa
Phone +27 11 472 3733
E-Mail info@sickautomation.co.za

South Korea
Phone +82-2 786 6321/4
E-Mail info@sickkorea.net

Slovenija
Phone +386 (0)1-47 69 990
E-Mail office@sick.si

Suomi
Phone +358-9-25 15 800
E-Mail sick@sick.fi

Sverige
Phone +46 10 110 10 00
E-Mail info@sick.se

Taiwan
Phone +886 2 2375-6288
E-Mail sales@sick.com.tw

Türkiye
Phone +90 216 528 50 00
E-Mail info@sick.com.tr

United Arab Emirates
Phone +971 4 8865 878
E-Mail info@sick.ae

USA/México
Phone +1(952) 941-6780
1 800-325-7425 – tollfree
E-Mail info@sickusa.com

More representatives and agencies
at **www.sick.com**

SICK
Sensor Intelligence.